STRICTLY CONFIDENTIAL (FR) CLASS I–FOMC

Material for

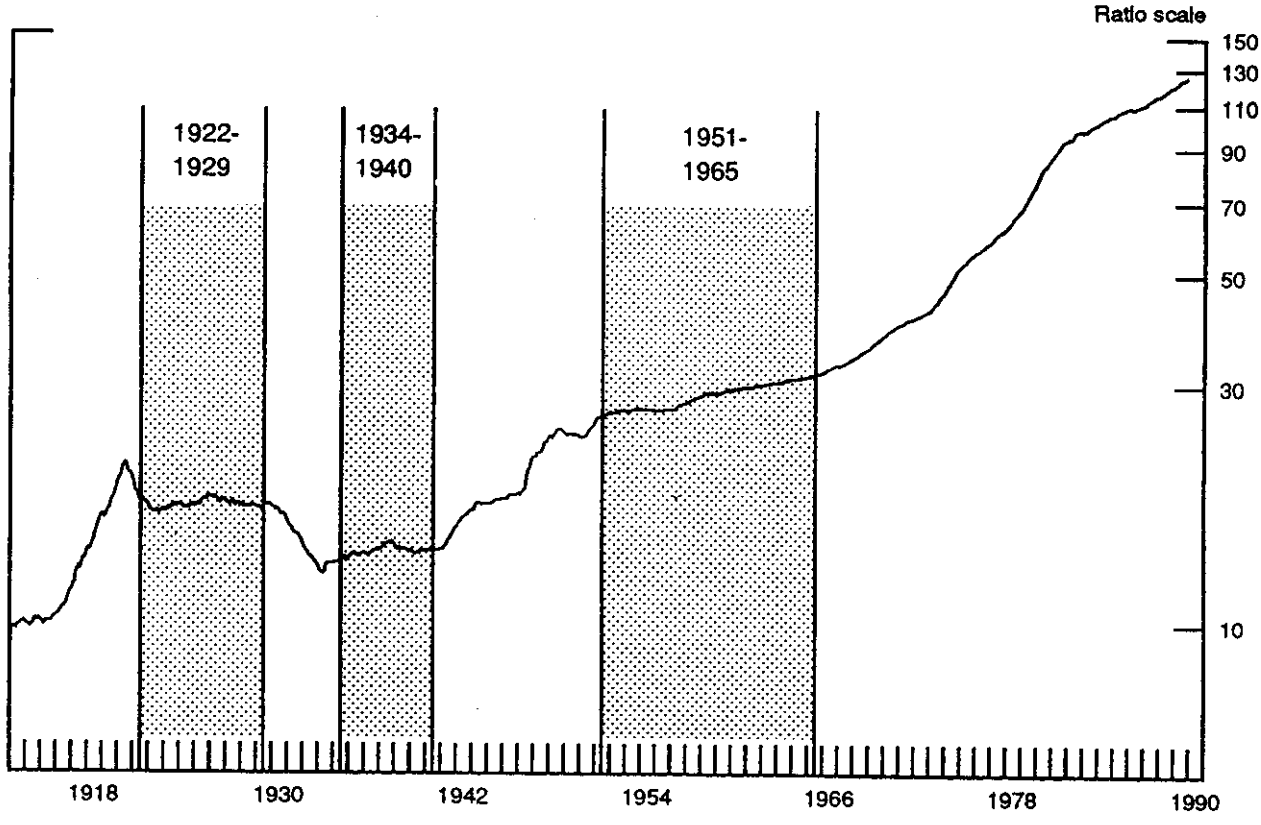
Special Presentation to the Federal Open Market Committee

December 18, 1989

Outline of Presentation

- The long-run relationship between money and prices
- Factors influencing the cost of disinflation
  - — Difficulties of reducing inflation expectations
  - — Establishing and maintaining the credibility of the central bank
- Econometric model simulations with different degrees of central bank credibility
- Possible impediments to price stability in five years
  - — Persistent downward pressure on the foreign exchange value of the dollar
  - — A jump in world oil prices
  - — A less restrictive fiscal policy
- Comparison of alternative strategies for disinflation

CPI, ALL ITEMS



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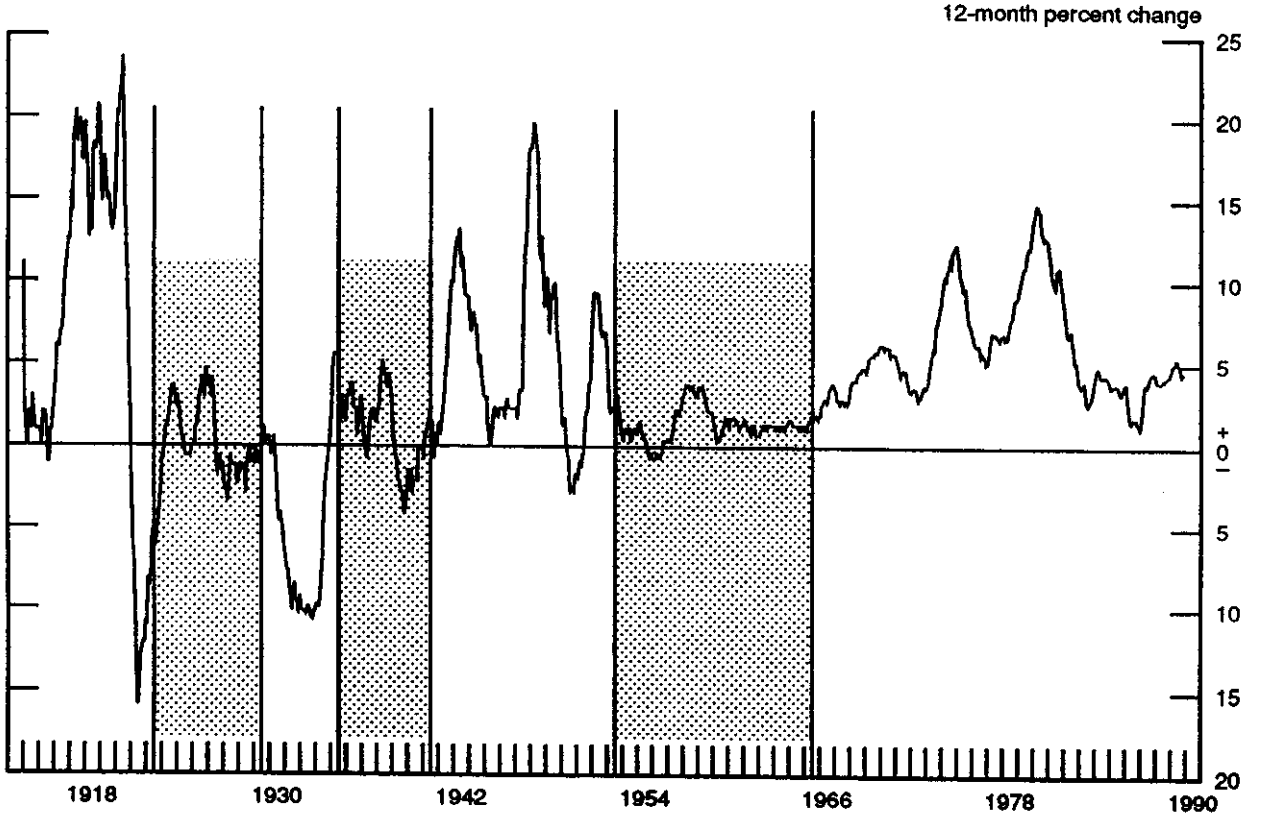


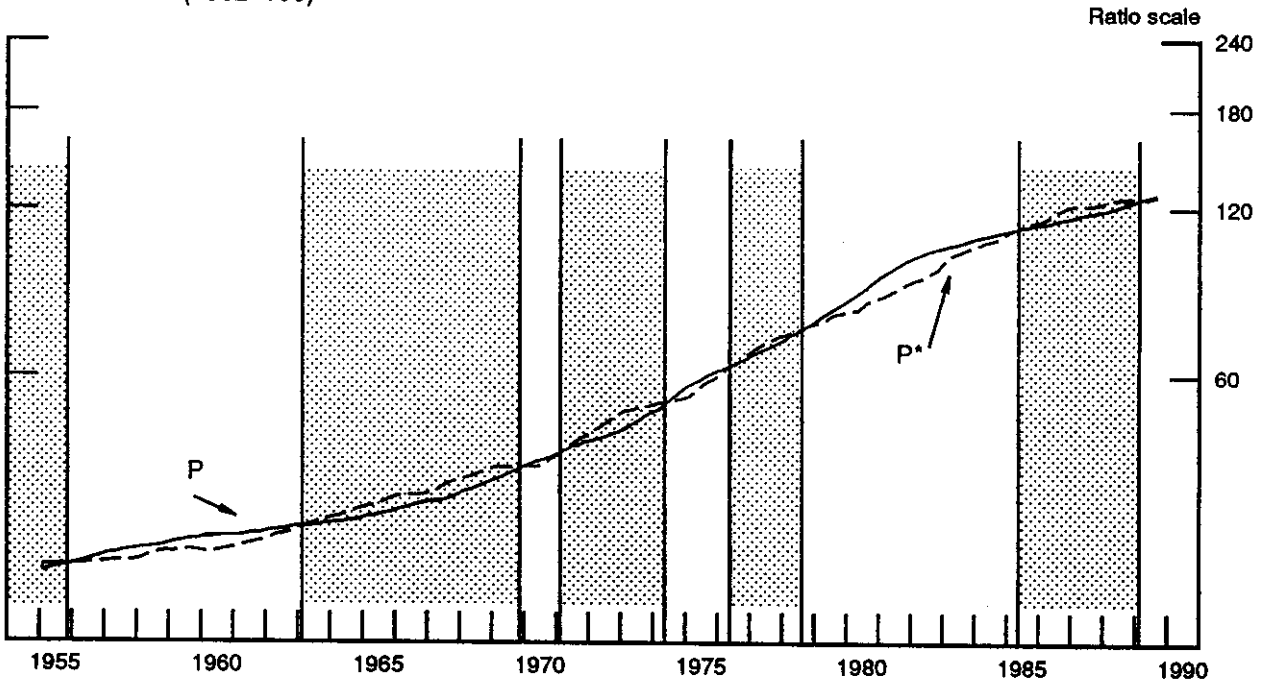
The P–star Model

(1) $P^* = M2 \bullet (V^* / Q^*)$

(2) $\pi_t - \pi_{t-1} = - \alpha (P_{t-1} - P^*_{t-1})$

P^* = equilibrium price level,
P = actual price level,
$M2$ = monetary aggregate,
V^* = historical average of M2 velocity,
Q^* = potential real GNP,
π = inflation rate.

PRICE LEVEL (1982=100)



GNP IMPLICIT PRICE DEFLATOR

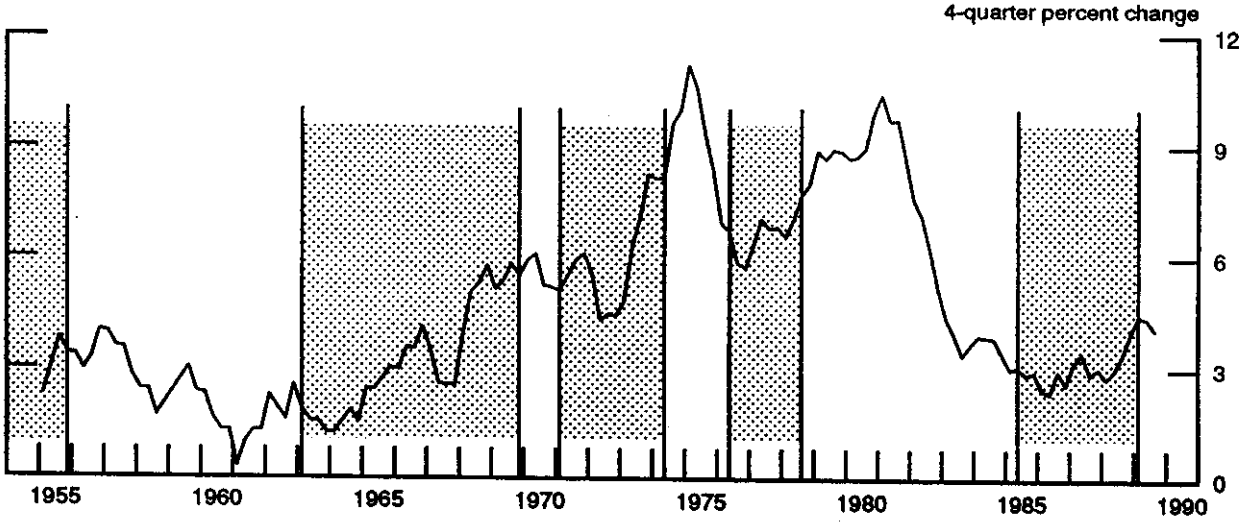
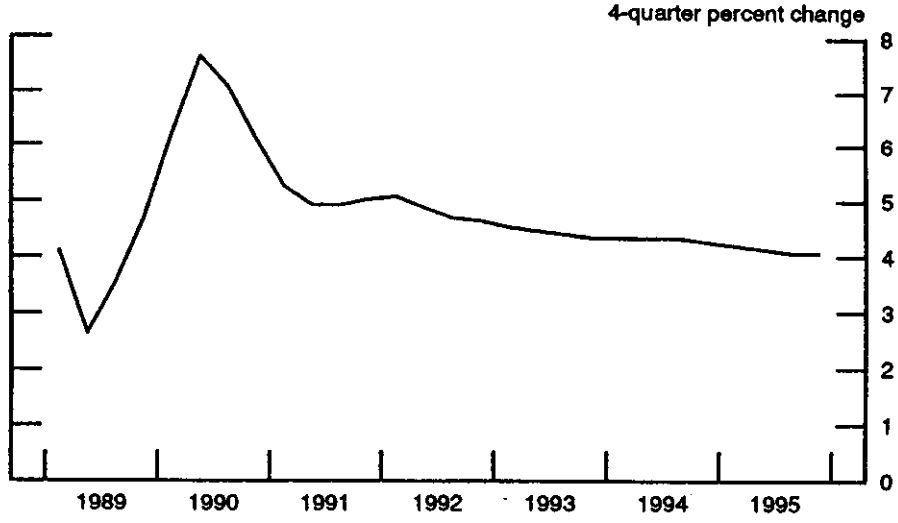


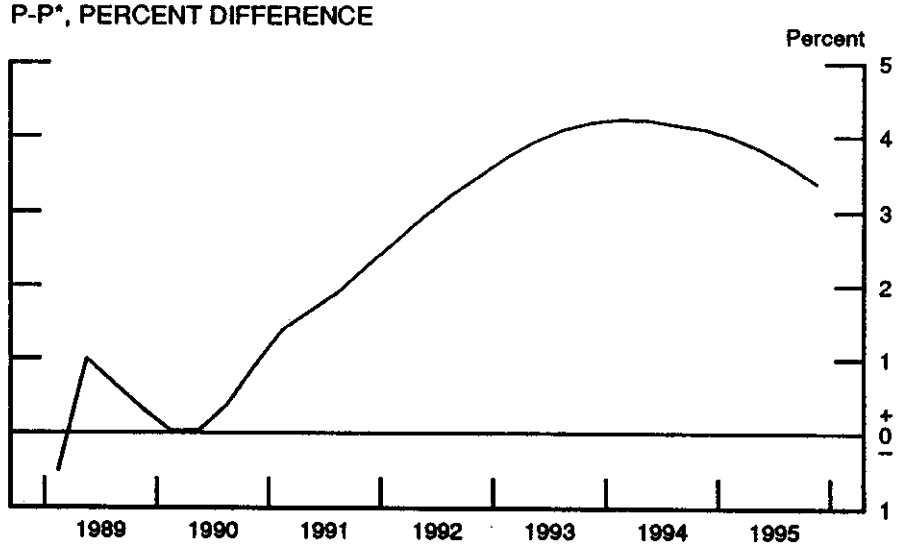
Exhibit 4

P-star Simulations

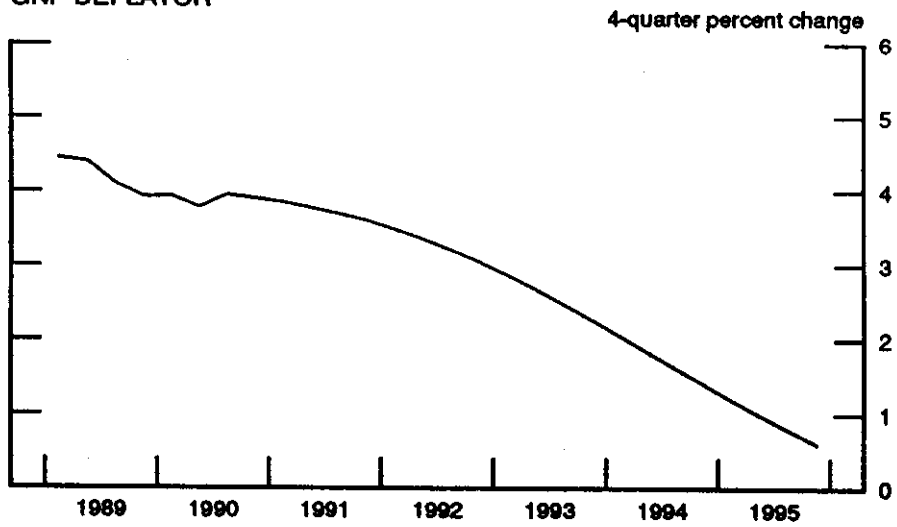
M2



P-P*, PERCENT DIFFERENCE



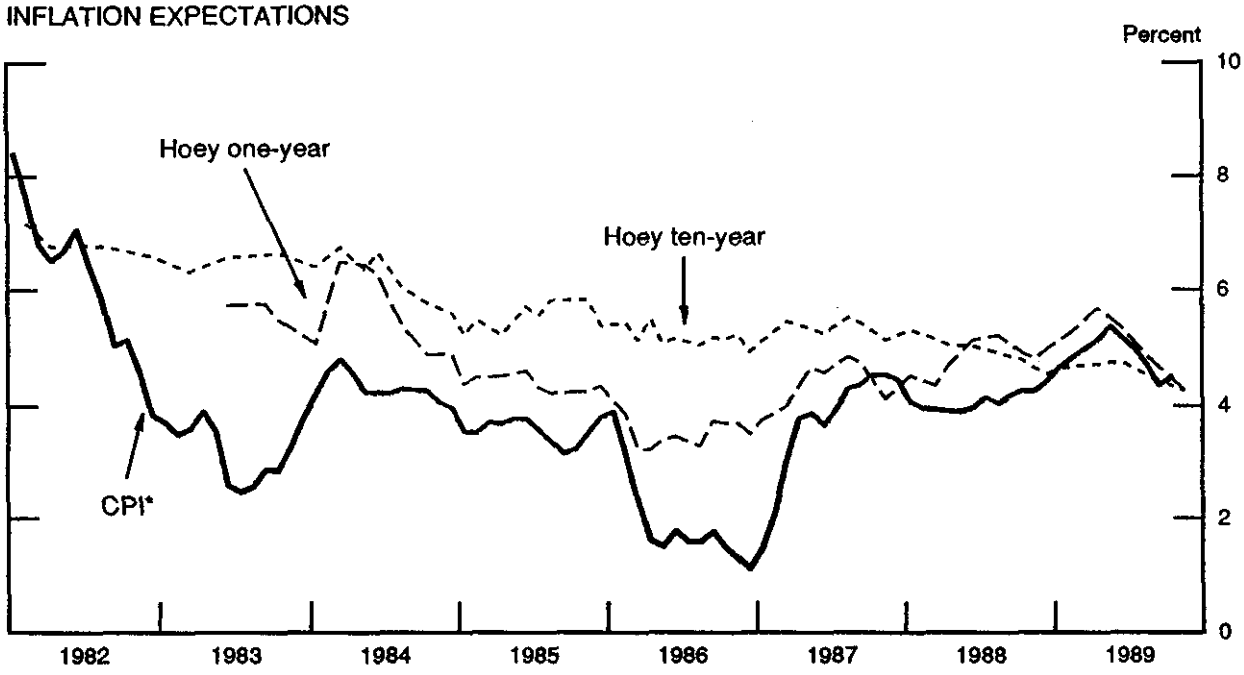
GNP DEFLATOR



Factors Influencing the Costs of Disinflation

- Nominal rigidities
  - — Wage and price contracts
  - — Costs of changing prices
  - — Decision lags
- Failure of inflation expectations to adjust correctly to changes in monetary policy

INFLATION EXPECTATIONS



* 12-month percent change

Alternative Hypotheses about Inflation Expectations

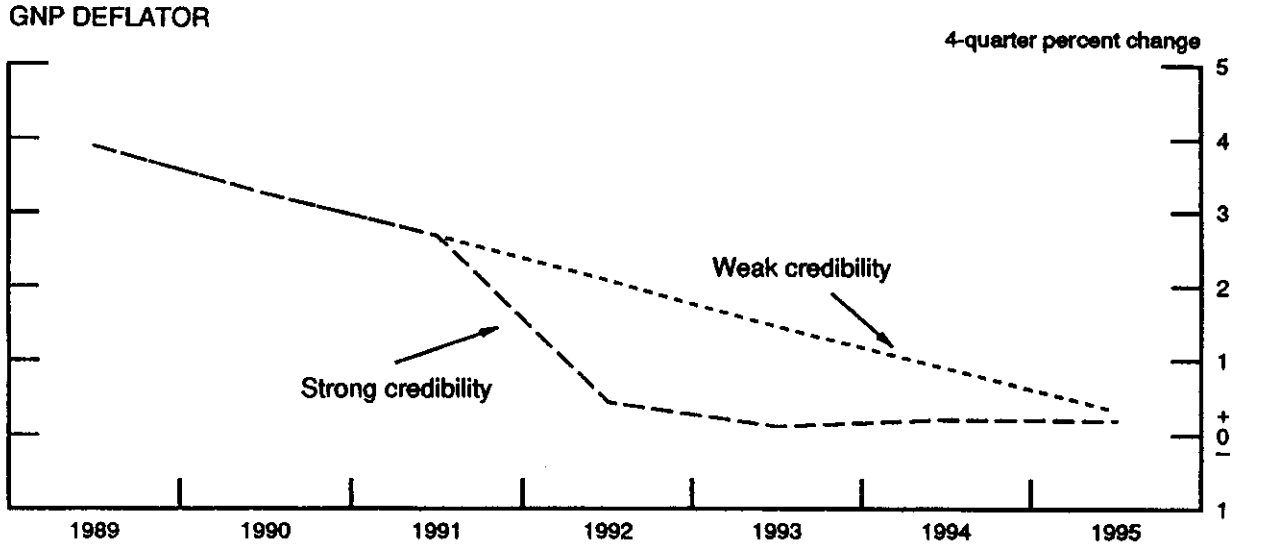
- FOMC **announcements** have complete credibility. Inflation expectations reflect current actions and announced monetary policy plans.
- FOMC **actions** have credibility. Inflation expectations reflect the observable actions of the FOMC, **but not announcements** concerning future intentions.
- FOMC actions and announcements have no direct effect on inflation expectations. Inflation expectations are formed by looking at past behavior of prices.

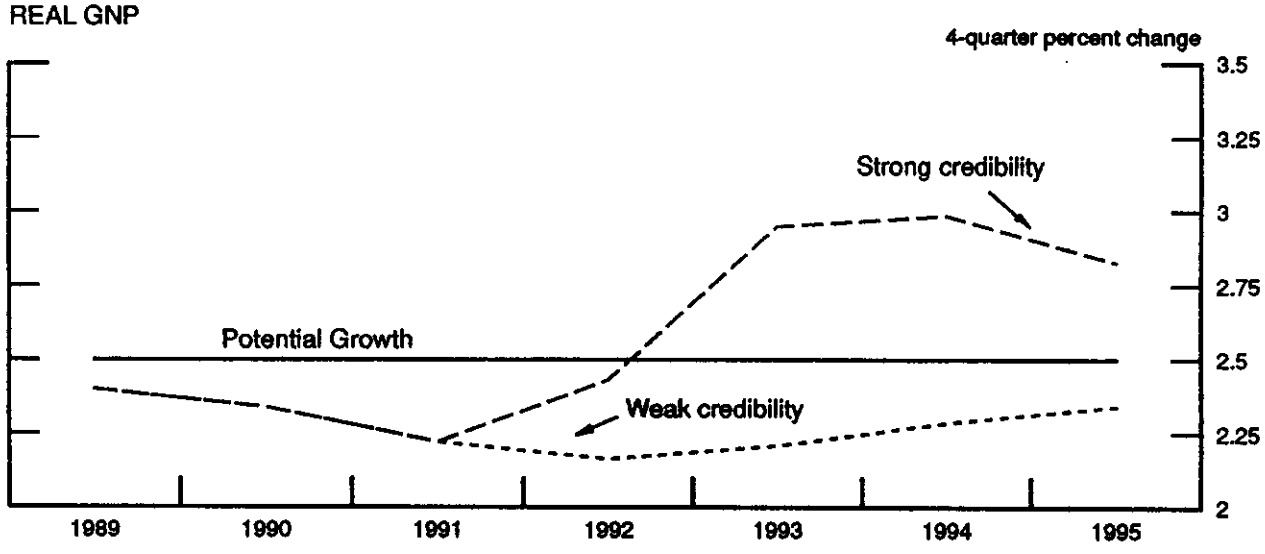
A Forward–Looking Model of the Economy

- Incorporates "rational expectations"
  - — Individuals are forward looking.
  - — Individuals understand the structure of the economy well enough to anticipate correctly the consequences of changes in monetary policy.
- Nominal rigidities
  - — Staggered contracts prevent immediate adjustment to unexpected changes in monetary policy.
- Assumptions about central bank credibility
  - — "Strong credibility"—After two years, wage and price setting behavior is altered on the basis of current actual and announced future changes in monetary policy.
  - — "Weak credibility"—Wage and price setting behavior incorporates current actual, but not announced future, changes in monetary policy.
- Additional assumptions
  - — In the absence of any significant change in real interest rates from current levels, the real foreign exchange value of the dollar would remain unchanged in real terms.
  - — Oil prices are constant in real terms.
  - — Full–employment Federal budget deficit is eliminated by 1996.
- Both simulations employ the same monetary policy.

Exhibit 7

Simulations of Forward-Looking Model





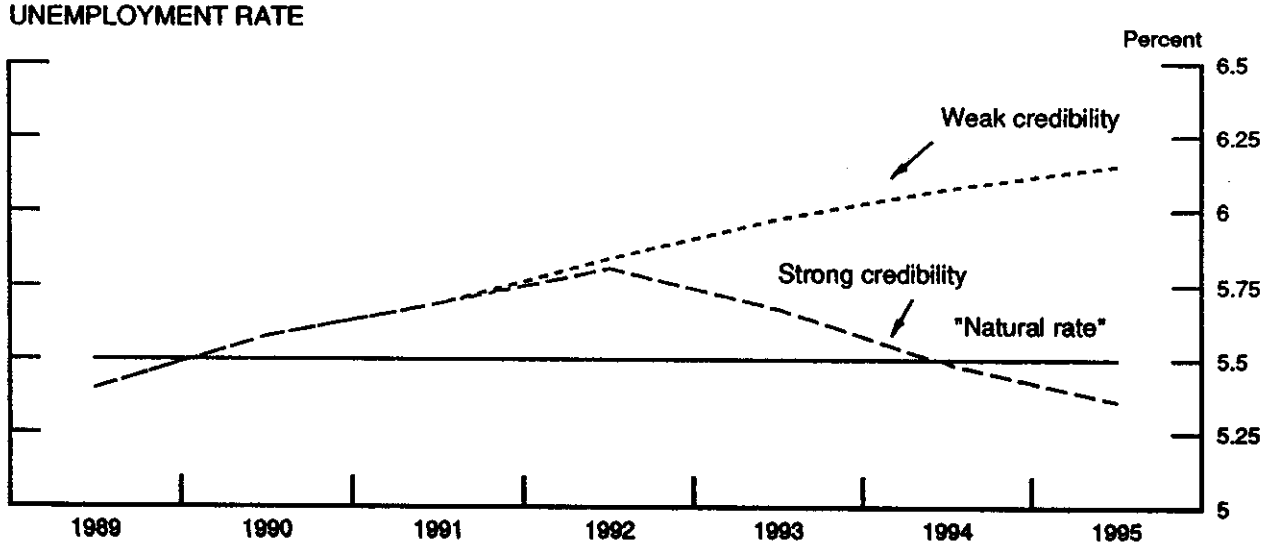
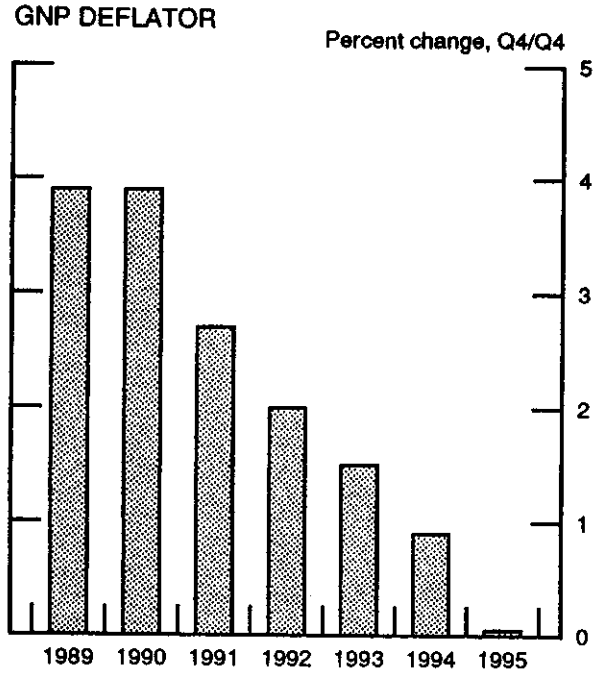
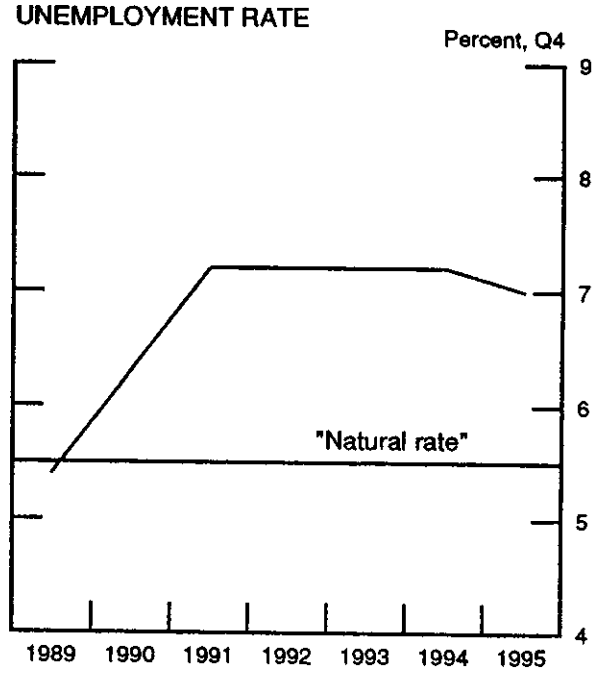
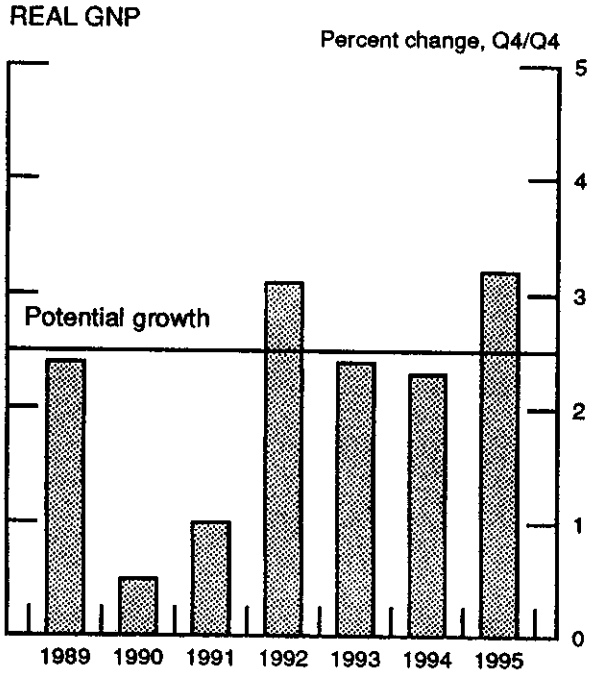


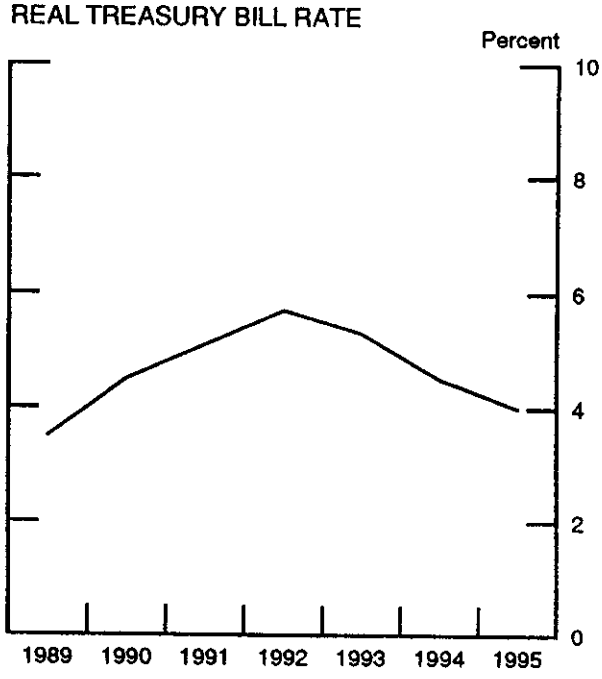
Exhibit 8

Zero Inflation Base Case









Sacrifice Ratios

		Change in inflation rate* (percentage points) (1)	Excess unemployment** (percentage points) (2)	Sacrifice ratio (2)/(1)
	Forward–looking model (1989–95)			
1.	Strong credibility	3.9	.7	.2
2.	Weak credibility	3.9	2.4	.6
3.	Board model (1989–95)	3.9	8.4	2.2
	Historical experience in U.S.			
4.	1957–61	2.6	7.1	2.6
5.	1970–72	.8	.8	1.0
6.	1975–77	3.1	6.8	2.2
7.	1981–85	6.7	11.8	1.8
	Foreign experience (1981–85)			
8.	Japan	1.2	2.6	2.2
9.	Germany	2.3	9.5	4.1
10.	France	7.1	5.8	.8
11.	United Kingdom	1.8	6.3	3.5
12.	Canada	7.5	13.5	1.8

* GNP implicit deflator

** Cumulative difference over the time period between the actual unemployment rate and the "natural rate" of unemployment.

Possible Factors Affecting the Realism of Model Simulations

- Increased global competition
- Heightened efficiency and cost consciousness on the part of business
- Diminished strength of labor unions
- Financial strains and financial fragility
  - — Our models are not equipped to shed much light on this case.
  - — A combination of higher real rates and weaker economic growth could affect highly leveraged firms or households.
  - — It is possible that more defaults could influence confidence more generally and have broader systemic effects.

GNP DEFLATOR

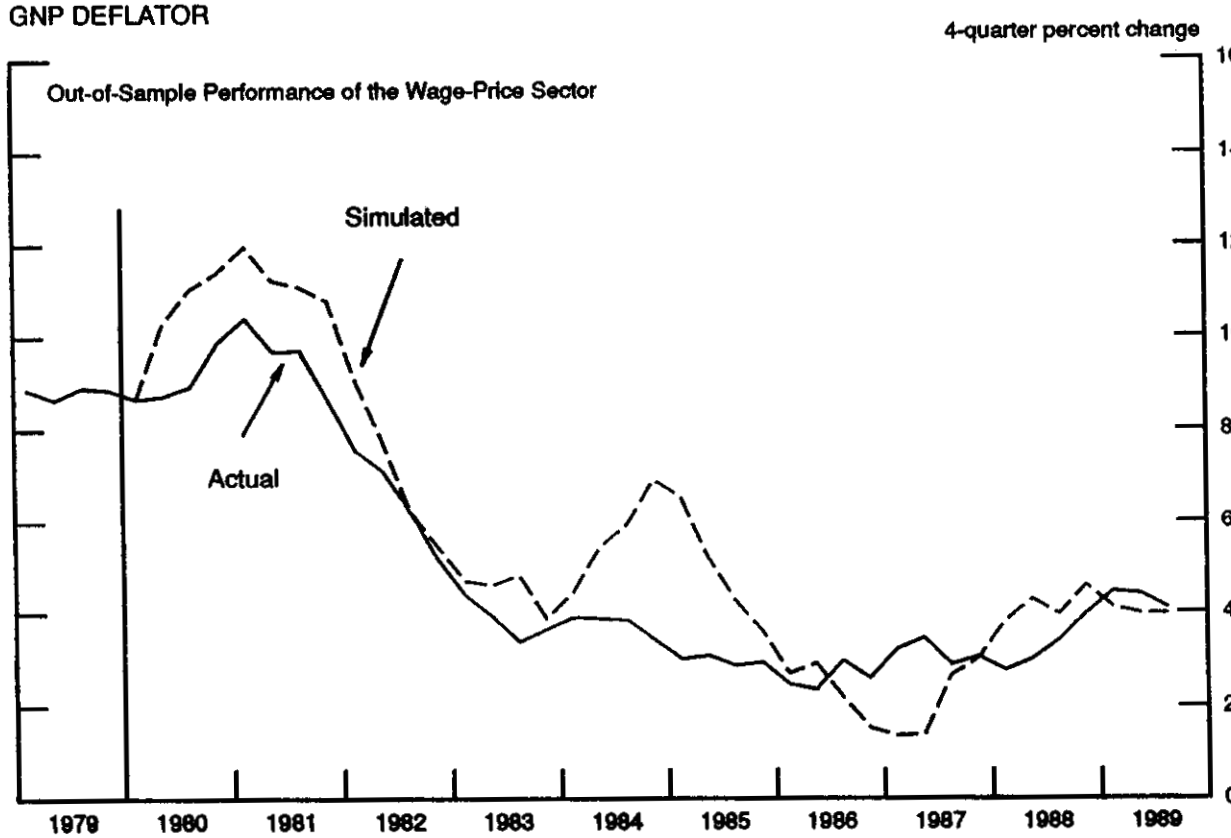
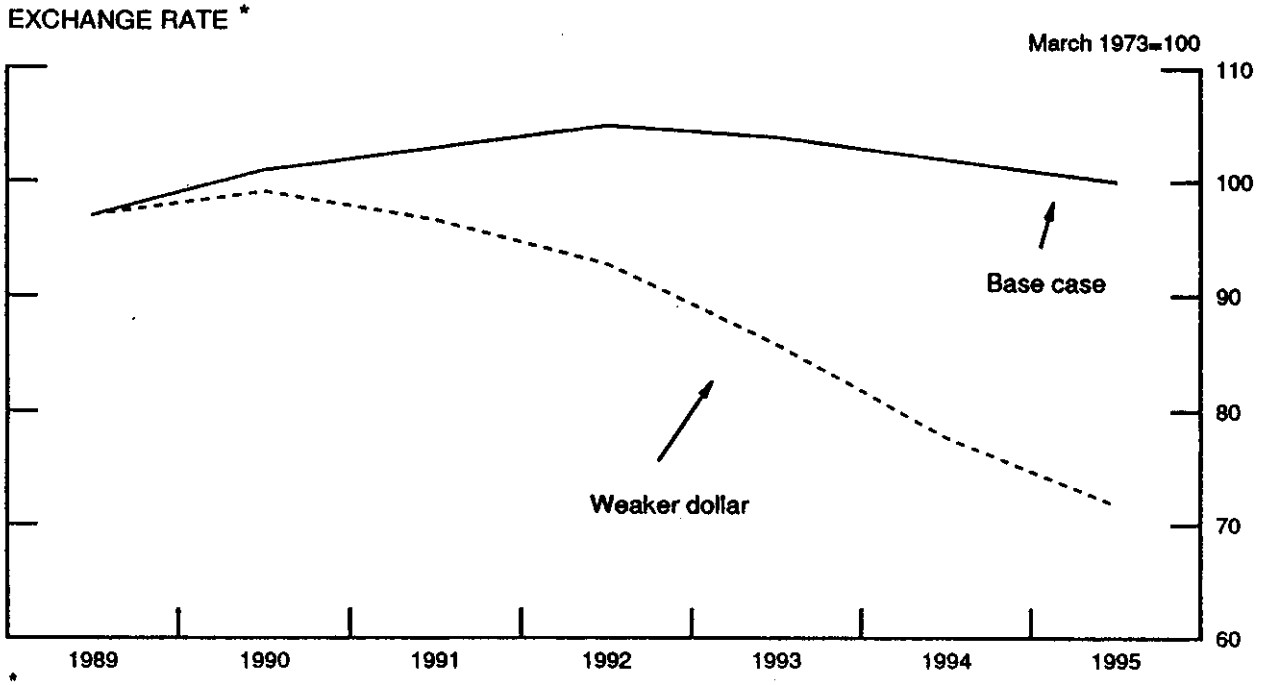


Exhibit 11

Alternative Exchange Rate Assumptions



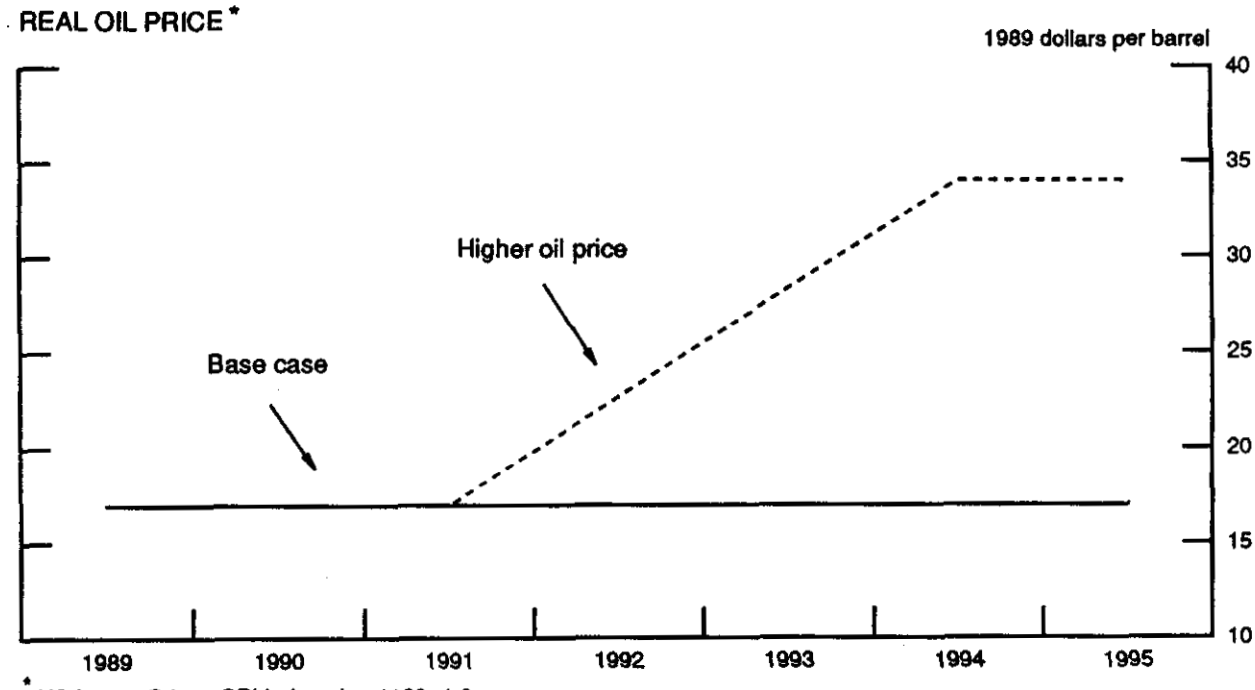
* FRB Index, G-10 currencies.

Weaker Dollar Exchange Rates

	1990	1991	1992	1993	1994	1995
1. Real Treasury bill rate (%)	4.8	5.4	6.3	6.4	6.3	7.0
2. *Base case*	*4.5*	*5.1*	*5.7*	*5.3*	*4.5*	*4.0*
3. Real GNP (% change, Q4/Q4)	.4	.9	3.0	1.6	2.0	2.7
4. *Base case*	*.5*	*1.0*	*3.1*	*2.4*	*2.3*	*3.2*
5. Unemployment rate (%)	6.3	7.3	7.3	7.5	7.8	7.7
6. *Base case*	*6.3*	*7.2*	*7.2*	*7.2*	*7.2*	*7.0*
7. Current account deficit (% GNP)	2.2	2.1	1.8	1.6	1.4	1.3
8. *Base case*	*2.2*	*2.4*	*2.4*	*2.3*	*2.3*	*2.3*

Exhibit 12

Alternative Oil Price Assumptions



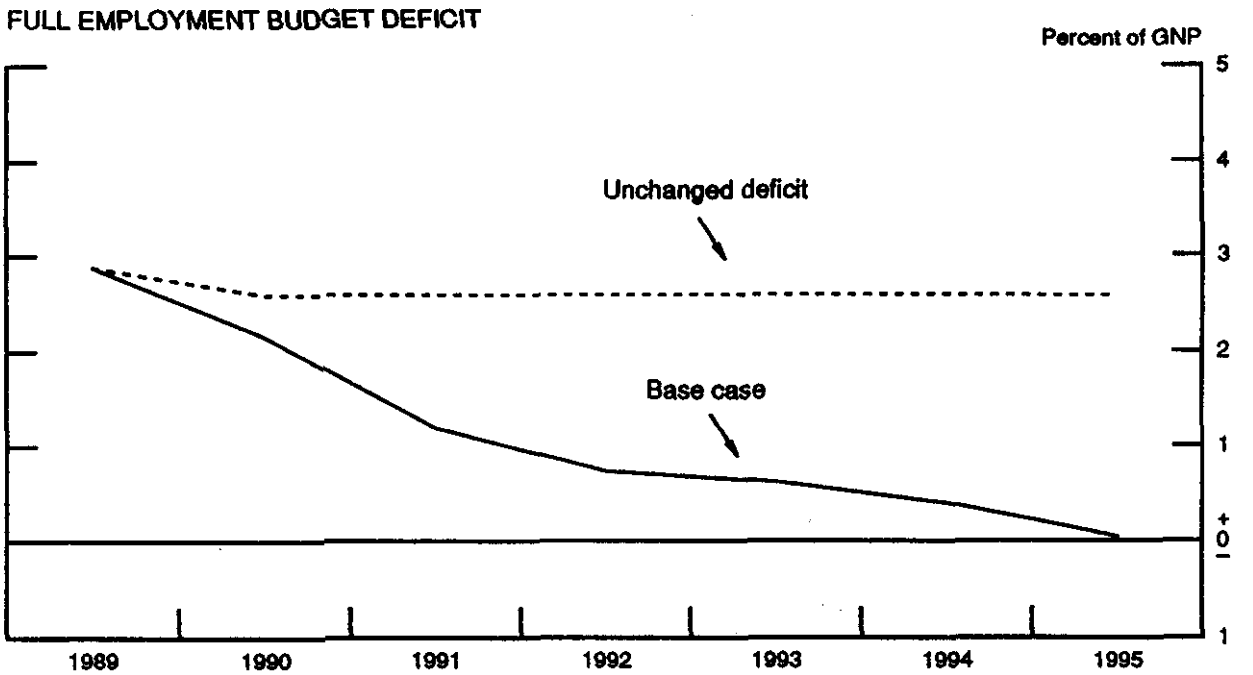
* US Import Price / CPI Indexed to 1989=1.0.

Higher Oil Prices

	1990	1991	1992	1993	1994	1995
1. Real Treasury bill rate (%)	4.5	5.1	5.6	5.2	4.8	5.0
2. *Base case*	*4.5*	*5.1*	*5.7*	*5.3*	*4.5*	*4.0*
3. Real GNP (% change, Q4/Q4)	.5	1.0	2.7	1.5	1.6	2.6
4. *Base case*	*..5*	*1.0*	*3.1*	*2.4*	*2.3*	*3.2*
5. Unemployment rate (%)	6.3	7.2	7.3	7.6	8.0	8.0
6. *Base case*	*6.3*	*7.2*	*7.2*	*7.2*	*7.2*	*7.0*

Exhibit 13

Alternative Fiscal Policy Actions



Unchanged Full-Employment Budget Deficit

	1990	1991	1992	1993	1994	1995
1. Real Treasury bill rate (%)	5.1	6.1	7.2	6.7	6.5	6.5
2. *Base case*	*4.5*	*5.1*	*5.7*	*5.3*	*4.5*	*4.0*
3. Real GNP (% change, Q4/Q4)	.8	1.4	2.6	1.6	2.2	3.0
4. *Base case*	*.5*	*1.0*	*3.1*	*2.4*	*2.3*	*3.2*
5. Unemployment rate (%)	6.2	6.9	6.9	7.1	7.3	7.1
6. *Base case*	*6.3*	*7.2*	*7.2*	*7.2*	*7.2*	*7.0*
7. Budget deficit (% GNP)	2.9	3.0	3.1	3.8	4.3	4.6
8. *Base case*	*2.7*	*2.4*	*2.1*	*2.1*	*2.1*	*1.8*

Costs of Achieving Zero Inflation Under Alternative Scenarios

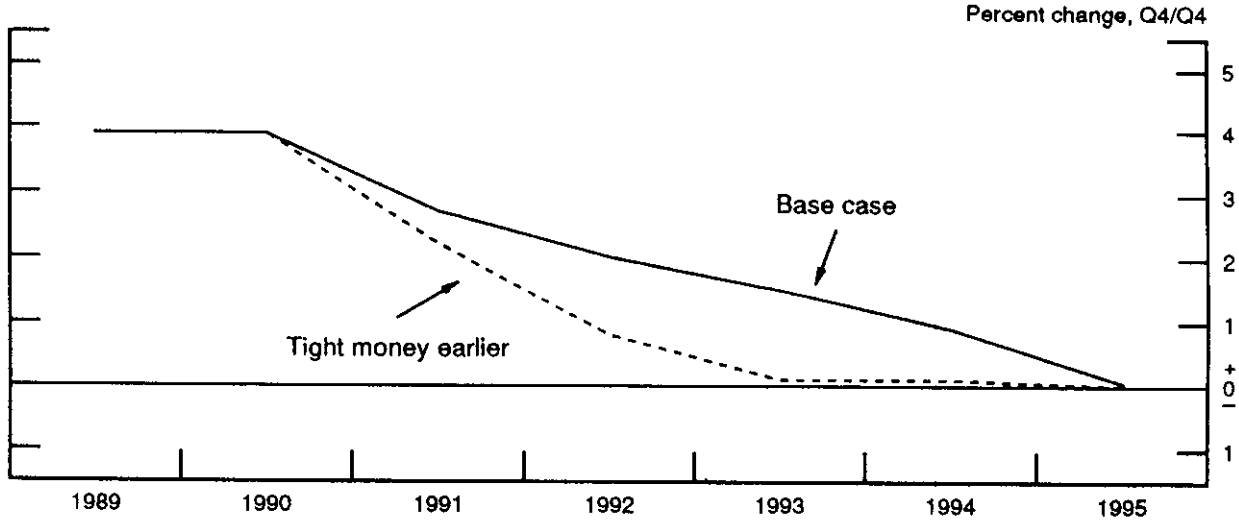
	Cumulative Losses 1989–95		
	Shortfall of GNP from potential[1] (percent) (1)	Excess of unemployment over natural rate[2] (percent) (2)	Sacrifice[3] ratio (3)
1. Zero inflation base case	20	8-1/2	2.2
2. With weaker dollar	24-1/2	9-1/2	2.5
3. With higher oil prices	25-1/2	10-1/2	2.7
4. With unchanged full–employment budget deficit	20	8	2.1

1. Calculated as the cumulative percentage gap between potential GNP and actual GNP from 1989 to 1995 .
2. Calculated as the cumulative gap between the actual unemployment rate and the natural rate (assume to be 5-1/2 percent) from 1989 to 1995.
3. Calculated as the cumulative excess of unemployment over the natural rate divided by 3.9 (the reduction in inflation between 1989 and 1995).

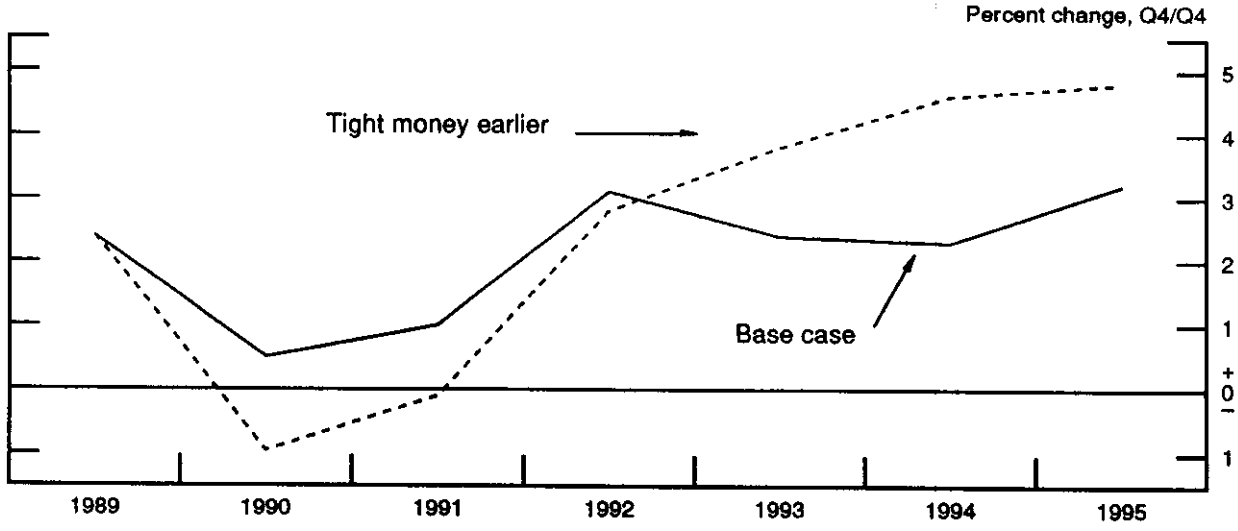
Exhibit 15

Alternative Policy Strategies

GNP DEFLATOR



REAL GNP



UNEMPLOYMENT RATE